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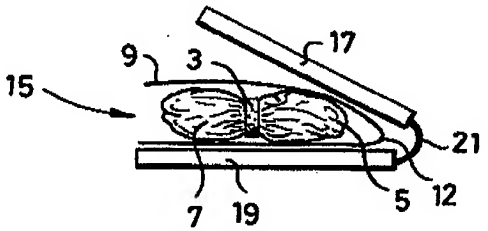

(57) Abstract

A method for the production of a size-reduced personal cleansing sponge (1) comprising: providing a polymeric mesh (2) personal cleansing sponge in a form suitable for use as a hand held cleansing implement, providing sealable non-air permeable sheet material (9), then placing the sealable non-air permeable material around the sponge (1), and evacuating air from the sponge (1), and then sealing the sealable non-air permeable material (9) around the sponge to form a sealed bag.

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PERSONAL CLEANSING SPONGE

The present invention relates to methods for the provision of a size-reduced personal cleansing sponge, the size-reduced sponge products and kits containing them.

It is known to provide personal cleansing sponges of a form suitable for use as a hand held cleansing implement, which are made of lightweight polymeric mesh (often diamond mesh polyethylene). These are used in applications for which conventional sponges are known, for instance for applying liquid cleanser such as shower gel. Production of these is described in for instance US 5,144,744, which explains the resilience to stretching of the diamond mesh. This document explains that the diamond mesh polyethylene netting sponges are superior to conventional sponges in that they are easier to clean.

WO95/00116 also describes the use of such sponges. This document explains the advantages of sponges of the polymeric diamond mesh type for use with moisturising cleansers. The sponges give a very good lather, in particular in comparison with conventional sponges. However, due to the nature of the product, the sponges tend to be rather voluminous. This leads to problems in providing efficient packaging. The amounts of packaging material required can be large. Further, transportation and storage space may be required to be large. One application in which this presents an especial problem is sampling of the products to consumers. In the known form they are too large to be sent by ordinary mail in

some countries, and in particular are too large to be posted through letter boxes of standard size for these countries.

Due to the nature of the material from which the sponges are formed, it has generally been expected that any reduction of the size of the sponge would lead to a loss of performance due to inability to regain its original shape.

It would therefore be desirable to provide a more efficient packaging system for polymeric meshed personal cleansing sponge products without reducing their performance.

According to a first aspect of the invention we provide a method of producing a size-reduced personal cleansing sponge comprising

providing a polymeric mesh personal cleansing sponge in a form suitable for use as a hand held cleansing implement,

providing sealable non-air permeable sheet material,

then placing the sealable non-air permeable material around the sponge, and

evacuating air from the sponge,

and then sealing the sealable non-air permeable material around the sponge to form a sealed bag.

We have found surprisingly that it is possible to reduce considerably the size of the polymeric mesh personal cleansing sponges by evacuating the air contained within them, so as to provide for more efficient storage, transport and, in particular, consumer sampling. Surprisingly, when the sealed, air-evacuated bag is opened the sponge is capable of reforming and expanding into its original shape, and may even do so rapidly and spontaneously after opening of the bag without any manipulation

of the sponge by the consumer. This is contrary to the generally held expectations discussed above. It also gives good lathering performance. These properties are found even when the sponge has been subjected to high vacuum or high compression or both and has been stored for long periods of time before reopening.

On opening the consumer observes that the sponge has been stored in substantially airtight conditions and observes that the sponge has been protected during storage and transportation from external contaminants.

The sponge is a polymeric meshed personal cleansing hand held sponge. Normally it is made of lightweight polymeric material. Preferably the polymeric material is such as to make the sponge hydrophobic. This hydrophobicity has the advantages that it enables the sponge to give a rich lather from liquid cleansing materials with which it is used.

The sponge is preferably formed from extruded tubular netting mesh which has been prepared from strong and flexible polymeric material. Extruded tubular netting mesh of this type, especially prepared from polyethylene, has been used in other applications and is readily available.

The sponge is in a form suitable for use as a hand held personal cleansing implement. Preferably it has a maximum diameter of from 5 to 20 cm, and preferably from 7 to 13 cm.

The sponge preferably comprises a plurality of plys of an extruded tubular netting mesh, the plys being folded upon themselves numerous times, often to form a soft ball-like polymeric mesh sponge. Tubes or stripes of netted mesh polymer can be used, securely attached by means of a nylon band or other suitable closure.

Sponges of this type are thus often produced in the form of two lobes held together by a band or knot at the centre of the sponge. Sponges of this type are described in US 4,462,135.

Preferably the sponge has a ball-like shape. An example of a hand held ball-like polymeric mesh sponge is disclosed in US 5,144,744, which describes a diamond mesh polyethylene sponge obtained by providing a number of netting tubes stretched over supports. These are joined and bound together at the centre and then released from the supports to form the sponge.

Particularly preferred polymeric materials for forming the sponge are polyethylene, in particular low density polyethylene (LDPE), LLDPE and mixtures thereof. The sponge can however be formed from any suitable strong flexible polymer, in particular addition polymers of olefin monomers and polyamides of polycarboxylic acids and polyamines.

Additionally, the sponge may be of a non-ball-like shape and may for instance be in the form of a rectangular glove.

In the invention commercially available polymeric mesh sponges may be used which are sold by Zeca s.r.l., Piacenza, Italy and Bynum Concepts Inc. Sponges may also be used as described in WO95/00116 and US 5,144,744. The sponge corresponding to International Design Number DM/014662 can be used.

In the process we provide non-air permeable sheet material for formation into a sealed bag. By non-air permeable material we mean material which prevents passage of air into the sealed bag which is formed in the process to such an extent that it can maintain a vacuum formed in the bag for the length of time which is

required for the product being made, for instance at least a month, and in some cases at least three or six months or even one year or more.

The sealable material is placed around the sponge which is to be size-reduced. The material is in the form of a sheet or sheets. It may for instance be in the form of a single sheet which is wrapped around the sponge and is then sealed at the open edges so as to form a bag after evacuation of air. Alternatively the material may be provided in the form of two sheets, one of which is placed under the sponge and one of which is placed over the sponge so that the sheets can be sealed together to form a bag after evacuation of air. Preferably the sheet material is in the form of a preformed bag.

The sheet material must be sealable, and is preferably heat sealable. The sheets may be formed wholly of material which is heat sealable. Alternatively a discrete region may be provided which is heat sealable and which can form the bag seal.

The sheet material may be formed of single layer polymeric material. Alternatively it may be formed from multilayer polymeric material. Suitable materials include those formed of a layer of polyamide (usually an external carrier layer) and a layer of polyethylene (usually an internal sealing layer). Suitable thicknesses for the polyamide layer include 10 to 30 microns, for instance about 20 microns. Suitable thicknesses for the polyethylene layer include 30 to 70 microns, for instance about 50 microns. The sheet material may be metallised.

In the invention any sheet material may be used which is known for use in vacuum packaging of materials.

The optimum shape for the sealed bag which is produced in the process can be found by experimentation within any given process. Preferably it is substantially rectangular in shape. For optimum processing it is desirable to provide a sealed bag of a size carefully chosen relative to the size of the sponge. Sealed bags which are not large enough in relation to the sponge give results which are inferior to those of sealed bags whose size has been optimised.

A particularly desirable shape for the sealed bag is rectangular with one pair of sides of length 5 to 30, preferably 10 to 20, for instance about 13 cm, and the other pair of sides of length about 10 to 30, for instance 15 to 25, in particular about 21 cm.

The shape of the sealed bag which is produced in the process is controlled by choice of the shape of the sheet material. The sheet material may be in the form of a bag, of a shape chosen to be suitable for the process in which it is used. Alternatively a sheet or sheets of material may be provided in such a form that when sealed they form a bag of the desired shape. For instance, if a rectangular bag is required, a single rectangular piece of sheet material can be used which is folded over on itself with the sponge placed in the fold. Alternatively two rectangular pieces of sheet material may be provided one below and one above the sponge. Either of these forms of sheet material can be sealed to provide a rectangular bag.

In the process the sheet material is placed around the sponge. That is, the sponge is placed within a space defined by the sheet material.

If a preformed bag is used, it is formed in such a way that the sponge may be placed within it before evacuation of air and sealing. Preferably the preformed bag

is sealed on all sides except for one aperture through which the sponge may be passed to place it in the preformed bag and through which air may exit the preformed bag.

In the process the sponge is placed in the preformed bag, if used, or within the space defined by the sheet material preferably in a position away from the designated region for sealing. For instance, if one edge of a rectangular preformed bag is designated as the region for sealing, the sponge is placed in contact with the opposite edge of the preformed bag.

In such a preformed bag a sponge of the two-lobed shape discussed above can be oriented in any desirable manner. However, if it is desired to obtain a size-reduced sponge which is of particularly low thickness, the sponge is preferably placed in the preformed bag flat with the lobes oriented along the centre line of the preformed bag, with one lobe directed towards the edge to be sealed and one lobe directed towards the opposite edge. It will be seen that similar principles can be applied to the use of sheets of sealable material.

In the process evacuation of air from the sponge may take place before or during positioning of the sealable sheet material around the sponge. Preferably evacuation of air is carried out after the sheet material has been placed around the sponge.

In the process air is normally evacuated from the space defined by the sheet material, eg from within a preformed bag, if used. As a result air is evacuated from the spaces within the sponge. This considerably reduces the size of the sponge.

Surprisingly the sponge can undergo this size reduction and be stored at 25°C for several months without suffering any performance disadvantages.

Evacuation of air from the space defined by the sheet material may be by compression only.

Alternatively evacuation may be effected by placing the sponge and sheet material under vacuum. The vacuum may be at least -50 mmHg, preferably at least -75 mmHg, for instance about -100 mmHg or greater.

In preferred processes both vacuum and compression are used. Subjecting the sheet material and sponge to vacuum gives very efficient air removal. Subjecting them to compression allows control of the final shape of the sponge in size-reduced form.

The process can be controlled so as to impart various final shapes to the sponge. The size-reduced sponge may for instance be substantially spherical (or ball-like), or in the shape of a slightly flattened sphere, or substantially cylindrical, but is preferably substantially flat and disc-like. When the sponge is of the two-lobed shape and is oriented as discussed above it will be thickest at the centre, at the position where the band or other holding means is provided to clamp together the tubes of polymeric netting.

Preferably the maximum thickness of a substantially flat packaged sponge is not more than 3 cm, preferably not more than 2.5 cm. It may even be not more than 2 cm. A flat shape is achieved by subjecting the sponge to compression between two flat surfaces during vacuum evacuation. For instance it may be placed between two board-like surfaces. In commercial use several bags containing sponges or

several sets of sheet material plus sponge may be compressed between a single pair of flat surfaces. It is preferred to provide two hinged board-like surfaces. The sheet material and sponge are placed between the hinged surfaces, with the region of the sheet material which is to be sealed preferably placed away from the hinge.

The shape of the sealable sheet material, particularly if it is provided as a preformed bag, can also be used to control the shape of the final size-reduced sponge. For instance, the shape of the size-reduced sponge can be controlled to be substantially cylindrical or "sausage" shaped by providing an appropriately shaped preformed bag or appropriately oriented sheet material.

The air is evacuated from the sponge for any suitable time. In some circumstances it may be necessary to optimise the time for evacuation. An evacuation time which is too short can result in a sponge which has not undergone sufficient size reduction. An evacuation time which is too long can undesirably affect the final appearance of the size-reduced product. For instance it may lead to creases or wrinkles in the sealed bag. We have found that a time of from 1 to 30 seconds can be useful, for instance about 2 to about 10 seconds. In some processes an evacuation time of about 5 seconds is particularly appropriate.

After sufficient evacuation of air from the sponge has been carried out the sheet material is sealed, preferably by heat sealing to form a sealed bag. The sheet material is sealed, sufficiently to prevent entry of air to the sealed evacuated bag.

Suitable sealing times for any particular bag and sponge system can be found by experimentation. Normally a sealing time of at least 0.1 seconds up to about 10

seconds is appropriate, for instance from 0.5 to 2 seconds. We find that a sealing time of about 1 second is often suitable.

Evacuation and sealing may be carried out using equipment known for vacuum or compression packing available from for instance SIG, Klockner and Swissvac.

After size reduction the size-reduced sponge may be stored for long periods of time at room temperature, for instance at least one or three months and even up to one year. It may also be stored (for at least two weeks) without significant loss of properties at temperatures of 30 and 40°C and above, for instance about 50°C.

When required for use by the consumer the sealed bag is opened so as to release the vacuum and the sponge expands to its original size. In some cases the sponge expands rapidly and spontaneously upon opening of the sealed bag to take up its original shape. In other cases, for instance if the size-reduced sponge has been stored for a very long period of time (eg more than 6 months) or stored at a high temperature (eg more than 35°C), the consumer may need to manipulate the sponge to aid in returning it to its original shape. Particularly good return to original size is obtained by immersing the reopened sponge in warm water, for instance 25 to 50°C, preferably 30 to 45°C, in particular about 40°C.

The sealed bag may be opened in any suitable manner, for instance the seal (or one of the seals) may be pulled open or the sealed bag may be cut open. The sealed bag may be provided with a line of weakness to allow easy opening, for instance attached to a tab. The sealed bag can be provided with a notch, optionally associated with a line of weakness, to assist opening.

The sealed bags may be coloured or printed if desired. Colouring or printing may be achieved by providing precoloured or preprinted sheet material or by printing or colouring after size reduction and sealing of the sponge.

According to a second aspect of the invention we provide a size-reduced polymeric mesh personal cleansing sponge contained within a sealed bag formed from non-air permeable material and from which air has been evacuated.

The sealed bag and sponge are such that air has been evacuated from them. In particular, the sealed bag containing the sponge contains an amount of air such that the pressure within it is below atmospheric pressure and in particular it contains substantially no air.

According to a third aspect of the invention we provide a personal cleansing kit comprising a size-reduced sponge produced by the process of the first aspect of the invention or a sponge according to the second aspect of the invention together with instructions for reforming the sponge to its original size. The instructions may simply comprise directions to open the package and allow the sponge to expand. The instructions may include instructions to manipulate the sponge to aid in returning it to its original shape. For instance, the consumer may be instructed to pull gently on the mesh forming the sponge to aid its expansion. Preferably the instructions comprise directions to immerse the sponge in warm water, preferably water at 25 to 50°C, more preferably 30 to 45°C, for instance about 40°C.

According to a fourth aspect of the invention we provide a personal cleansing kit which comprises a size-reduced sponge produced by the process of the first aspect of the invention or a sponge according to the second aspect of the invention

together with a liquid cleansing composition, for instance shower gel. This can be a conditioning composition, which preferably has an oil phase comprising an effective amount of a skin conditioning ingredient and an aqueous phase comprising an effective amount of a surfactant selected from soap and synthetic surfactants and mixtures thereof.

In this aspect of the invention any of the liquid cleansers may be used which are described in WO95/00116.

The invention will now be illustrated with reference to the attached Figures and illustrative process, described below.

Figure 1 shows a preferred polymeric mesh sponge for use in the process of the invention before size reduction.

Figure 2 shows a preferred compression system for use in the process of the invention in cross-section.

Figure 3 shows a preferred size-reduced sponge of the invention in cross-section.

Figure 4 shows the size-reduced sponge of Figure 3 from above.

In the process of the invention the sponge 1 shown schematically in Figure 1 is provided. The sponge, obtained from The Sponge Factory in the Dominican Republic, comprises tubes of LDPE mesh 2 held together by a band 3 at a central "knot". It thus (on separation of the tubes of mesh) has two lobes 5 and 7.

In the process of the invention the sponge is placed within sheet material which is a bag 9 which is formed from a bilayer film formed from a 20 micron thick layer of polyamide and a 50 micron thick layer of polyethylene, the polyamide layer

forming an external barrier layer and the polyethylene layer forming an internal sealing layer. The bag 9 is rectangular and has three sealed edges 11, 12 and 13 and one open edge 15. The sponge is inserted into the bag through the opening 15 and placed with lobe 5 adjacent to the sealed edge 12 and lobe 7 adjacent to the open edge 15. The bag is then placed between two boards 17 and 19 which are joined together at a hinge 21. The entire assembly is placed inside a vacuum apparatus (not shown). Vacuum is then applied at the same time as compression which is applied by reducing the angle between the boards 17 and 19. The vacuum applied is -100 mmHg and the vacuum and compression step lasts approximately 5 seconds. The open edge of the bag 9 is then heat sealed to preserve the vacuum. Heat sealing takes about 1 second. The resulting packaged size-reduced sponge is shown schematically in Figure 3. The thickness A of the compressed sponge at its thickest point is approximately 2 cm. The view of the packaged size-reduced sponge is shown in Figure 4 from above.

Similar results can be achieved using, instead of a bag 9 which has three sealed edges 11, 12 and 13, two identically sized pieces of the bilayer film. The first piece of sheet material is placed on the board 19, the sponge is placed on the piece of sheet material and the second piece of sheet material is placed on top of the sponge. After evacuation and compression all four edges 11, 12, 13 and 15 are sealed.

Alternatively a single piece of bilayer film can be used folded so as to form a single sealed edge 12. Edges 13, 15 and 11 are then sealed after compression and evacuation of air.

WHAT IS CLAIMED IS:

1. A method for the production of a size-reduced personal cleansing sponge comprising:

providing a polymeric mesh personal cleansing sponge in a form suitable for use as a hand held cleansing implement,

providing sealable non-air permeable sheet material,

then placing the sealable non-air permeable material around the sponge, and evacuating air from the sponge,

and then sealing the sealable non-air permeable material around the sponge to form a sealed bag.

2. A method according to claim 1 in which the sealable non-air permeable sheet material is in the form of a sealable bag.

3. A method according to claim 1 or claim 2 in which the sponge is formed from a plurality of plys of extruded low density polyethylene mesh.

4. A method according to any preceding claim in which the sealed bag has a substantially flat shape, preferably a substantially flat rectangular shape with one pair of sides of length 5 to 30 cm and the other pair of sides of length 10 to 30 cm.

5. A method according to any preceding claim in which the air is evacuated from the sponge under vacuum and compression.

6. A method according to any preceding claim in which the sponge and sheet material are compressed between two substantially flat surfaces during evacuation of air.

7. A method according to any preceding claim in which the evacuation of air takes up to 10 seconds.

8. A size-reduced personal cleansing sponge obtainable by the method of any of claims 1 to 7.

9. A size-reduced polymer mesh personal cleansing sponge contained within a sealed bag formed from non-air permeable material and from which air has been evacuated.

10. A personal cleansing kit comprising a size-reduced sponge according to any of claims 1 to 9 together with instructions for reforming the sponge to its original size.

11. A kit according to claim 10 in which the instructions comprise instructions to open the sealed bag, remove the sponge and immerse the sponge in water at a temperature of from 30 to 50°C.

12. A personal cleansing kit comprising a size-reduced sponge according to any of claims 1 to 9 together with a liquid cleansing composition.

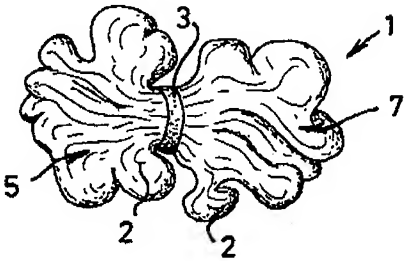


Fig.1.

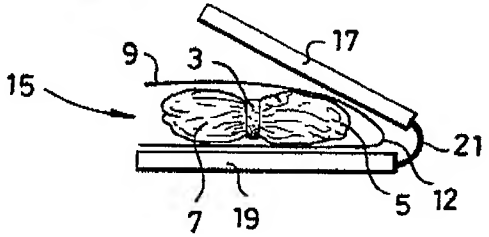
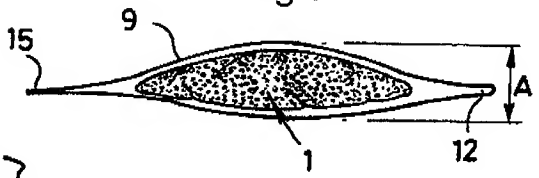


Fig.2.

Fig.3.



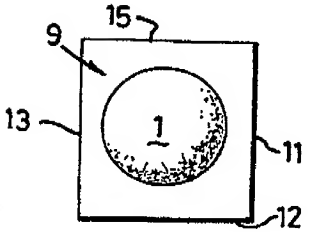


Fig.4.

INTERNATIONAL SEARCH REPORT

Int. ional Application No
PCT/US 98/16827

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A47K7/02 A47K7/03 B65D81/20

According to International Patent Classification(IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 A47K B65D

Documentation searched other than minimumdocumentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	FR 2 112 593 A (MOLENA AG.) 23 June 1972	1,2,5,6, 8,12
A	see page 2, line 28 - page 3, line 37; figures 1-4	9
A	US 4 866 806 A (BEDFORD) 19 September 1989	1,2,5,8, 12
	see column 4, line 34 - line 41	
A	US 5 144 744 A (CAMPAGNOLI) 8 September 1992 cited in the application see column 1, line 53 - column 2, line 14; figures 1-4	1,3
	-/--	

[X] Further documents are listed in the continuation of box C. [X] Patent family members are listed in annex.

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Date of the actual completion of theinternational search	Date of mailing of the international search report
29 October 1998	05/11/1998

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INTERNATIONAL SEARCH REPORT

Int ional Application No
PCT/US 98/16827

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category '	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 95 00116 A (THE PROCTER & GAMBLE COMPANY) 5 January 1995 cited in the application see abstract	1
A	US 5 368 581 A (SMITH ET AL.) 29 November 1994	

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INTERNATIONAL SEARCH REPORT

Information on patent family members

Inte: ional Application No
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